

the Treaty of Picolata. On this trip he discovered *Franklinia*, *Pinckneya*, *Nyssa ogeche*, *Canna flaccida*, and other noteworthy plants. He was accompanied and assisted by his talented son, "Billy," who was destined to become the author of the immortal *Travels* (1791).

The record of these achievements appears in the simple, unvarnished diary of 1765–66, preserved at the Historical Society of Pennsylvania and hitherto largely unpublished. The full editorial comments and annotations provide a historical background, identify Bartram's plants and animals, and show his routes in detail by means of both colonial and modern maps. Photographs and drawings bring into vivid focus, after a span of nearly two centuries, many of the points of particular interest that were visited by John Bartram.

Much new light on William Bartram's celebrated *Travels* (1791) will be forthcoming with the publication, in part 2, of his lengthy manuscript report to his London patron, Dr. John Fothergill. This important document, which has long remained in obscurity in the British Museum, will be a distinct boon to all students of Bartram and of early American natural history. While it covers the same ground as the first part of the book of 1791, it is not a duplicate of that work, but contains much additional information on Bartram's itinerary, his chronology, his scientific and literary qualifications, and the identification of his plants and animals. The work is thoroughly annotated and indexed. The illustrations include the most significant collection of Bartram drawings ever brought together in a single publication.

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Carnivorous Plants

The Carnivorous Plants. By Francis Ernest Lloyd. xv + 352 pages, 38 plates. Waltham, Mass., The Chronica Botanica Co., New York City, E. G. Stechert and Co. 1942. \$6.00.

"For the present moment, I care more about *Drosera* than the origin of all the species in the world," wrote Charles Darwin, in 1860, to his friend Sir Charles Lyell. It is fortunate that he found time to consider both, for his investigations on *Dionea*, *Drosera*, and physiologically related plants resulted in the publication of the

first book on this group, which has remained the only one available in English for the past sixty-eight years.

It is in a similar spirit that Dr. Lloyd has now summarized the researches in this field. Karl von Goebel reviewed the work in 1891 in a section of his book, "Pflanzenbiologische Schilderungen." Since then, various contributions have been made, including the skillful researches of Lloyd on *Utricularia* and the respective studies of Vines and Hepburn on the digestive action of the pitcher fluids of *Nepenthes* and *Sarracenia*. The glandular secretions of *Drosera* were investigated in a similar manner by Okahara. The existence of carnivorous fungi has recently been established, and new interesting interpretations of the mechanisms of closure of the leaves of *Dionea* and *Aldrovanda* have been made by Brown in the United States and Ashida in Japan.

There has long been a need for a comprehensive, modern treatment of the carnivorous plants (Dr. Lloyd prefers this term to insectivorous). The present volume seems entirely adequate. It is a precise and scholarly work. The author has carried on intensive investigations in this field since 1929, when he made his first observations on the trap of *Utricularia gibba*. The book contains a great stock of his own experiments and verifications of the results of others. For example, in the case of *Roridula*, Dr. Lloyd is now definitely able to exclude this genus from the carnivorous plants. Many of the plants, especially the Utriculariæ, were studied in their native habitats. Two trips to Africa and one to Australia were made for this purpose.

The text is divided into fourteen chapters, each for the most part corresponding to a separate genus. The distribution of the plants is unusual. They either fall into groups which are widely distributed, like *Drosera* or *Utricularia*, or else they exist as monotypic or very local genera, as *Cephalotus*, *Genlisa*, *Dionea*, and others. The chapters are arranged according to the increasing order of complexity of the traps. Thus we find, in this rather ingenious system of classification, that the passive, pitfall traps, as represented by the pitched leaves of *Heliamphora* and *Sarracenia*, are placed first. Passing upward through the lobster pots, snares, fly-paper and active, bear-trap devices, we come to the mouse trap, or most complex type which includes such forms as *Biovularia*, *Utricularia*, and *Polypompholyx*. One chapter is devoted to the fungi that

prey upon small water animals, notably eelworms and rotifers. Modifications encountered in this unique group are hyphal loops that swell and clamp onto the body of a worm unluckily enough to enter, and sticky plugs that literally gag their victims to death. This appears to be the first complete discussion of the findings of Drechsler and others on these fungi. Although Dr. Lloyd, in reviewing the genus, mentions the use of the name "*Chrysamphora*" in place of the much more familiar "*Darlingtonia*," which it antedates, he continues to use the latter name. The literature cited on *Utricularia* records twelve papers by the author embodying new concepts on the operation of the traps, and an additional two describing four new species discovered in Australia. An appendix is added as a sort of patent registry to describe an epoch making mouse catching device constructed on the principles of the *Utricularia* trap. Its efficacy is assured, since if it did not catch the mouse it would undoubtedly leave him with a severe nervous breakdown.

With very few exceptions, the drawings are original. They are ample and very well done. The plates are included at the back. Due to a regrettable economy of space, many of the photographs have been cut down and placed in a sort of mosaic on the page, with a resultant loss of clarity. In every other detail, however, the book shows great care in its preparation. The paper, print, and binding are good. The frontispiece is an old drawing of a species of *Nepenthes* from an early herbal.

Above all, it is well to remember that "The Carnivorous Plants" represents the achievement of more than twelve years of painstaking work. Dr. Lloyd has not left the smallest pebble unturned in his effort to follow up every source. As witness to his consuming interest in the field, there are very few chapters that do not contain some of his own pertinent, and usually outstanding, contributions.

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